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Gray, in his systematic arrangement of plants, places this genus in the family Araceæ, but Lindley, on account of there being no raphides, and as the general characters of the plant would not permit of its being placed in any other family, places it in a family by itself, calling it Acoraceæ. This genus contains but few crystals of any sort. On examining a number of specimens I found only a few crystal prisms, which effervesced and dissolved with hydrochloric acid and were probably oxalate of lime. With the exception of the genus Acorus the crystals mentioned in this family showed with certainty that they were composed of phosphate of lime when the chemical tests were applied both under the microscope and also to the incinerated residue.

[*To be continued.*]

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EDITORS' TABLE.

EDITORS: A. S. PACKARD, JR., AND E. D. COPE.

—— The late meeting of the American Association for the Advancement of Science at Boston, under the presidency of the Hon. L. H. Morgan, was a very successful one. There was a large attendance, most sections of the United States and Canada being represented. A considerable number of papers of a high order of merit were read. Propositions for a precise and convenient division of the work of the Association were considered, and a report on the subject may be expected at the next meeting.

The arrangements made by the local committee were excellent, and the most convivial member could not complain of any deficiency of receptions or "lunches," either as to quantity or quality. The excursion to the White mountains was replete with interest to the geologist, the more so as it was accompanied by the State Geologist of New Hampshire, Prof. Hitchcock.

Of the addresses of the officers, we refer to two as especially interesting to our readers, viz: those of Prof. Barker, the retiring president, and of Mr. Agassiz, vice-president in charge of Section B. The former was a general exposition of the present state of knowledge of the physics of life. The chemical nature of the respiratory and digestive functions, and the dynamic characteristics of muscular contraction were passed in review. The character of nervous telegraphy was discussed, and its relations to mental phenomena considered. The conversion of force in reference to these acts was set forth in the light of recent investigations, especially those conducted by the aid of the plethysmograph. The identity of conduct of vegetable and animal protoplasm under stimuli and reagents, was regarded as warranting the conclusion that the properties of animal protoplasm have a previous existence in the plant, and that the solution of the vital question in the lowest fungus will solve the problem for the highest vertebrate.

The address then considers the relations of the forces displayed by living bodies to those exhibited by the space-filling ether. In accordance with late usage he discards the term potential energy, and regards the energy of the supposed molecular movements of the ether as representing what was originally intended by that expression. He closes by remarking, "Is it a wonder that out of such a reservoir, the power by which we live should irresistibly rush into the organism and appear as the transmuted energy which we recognize in the phenomena of life?" Further than this speculation can not go, but such language is useful if only as an indication that the field of vital phenomena is not necessarily restricted to our planet or even to our system.[1]

We note here that Prof. Barker has not touched on the question of consciousness in his address, and it might be supposed that he does not regard it as an essential element in the problem. This omission may be explained on the supposition that he does not know what to do with it; for it certainly does not seem to have any appropriate niche in the system of the purely physico-vitalists. For our own part we cannot escape it in considering the evolution of forms; that is. as modifying growth nutrition, through molar movements.

Mr. Agassiz's address is an exposition of the palæontological and embryonic histories of the *Echini*, with a discussion of their bearing on the question of evolution. He refers to the early labors of Profs. Agassiz and Vogt on the palæontology and embryology of fishes as the starting point of discussion of the doctrine of parallelism. After a thorough review of the facts, Mr. Agassiz finds the history of the *Echini* to present a conformity to the general law, and that it exhibits, moreover, certain peculiarities. The rule is, that each character taken separately presents an "exact parallelism" between its palæontological and its embryonic histories, but the characters taken collectively, in the combinations which constitute species, do not present such a parallel. In other words, that no extinct species, taken as a whole, is identical with a transitional stage of any recent species. He says, "Any attempt to take up a combination of characters, or a system of combinations, is sure to lead us to indefinite problems far beyond our power to grasp." Here we see the author wrestling with the universal phenomenon of "inexact parallelism," which has received satisfactory explanations at various times.[1]

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[1] See *Penn Monthly*, 1875, p. 574. AMERICAN NAURALIST, 1879, 420, and 1880, p. 269.

It is gratifying to find Mr. Agassiz giving a general assent to the doctrine of derivation, but we observe that he cannot forbear intimating that he does not enter the ranks of the evolutionists on account of the society he finds there. He says in effect,—your derivation is probably true, but you can't tell how it was done, so what are you going to do about it? And he proceeds to show that they cannot do anything about it, in the following manner: "The time for genealogical trees has passed; its futility can, perhaps, best be shown by a simple calculation which will point out at a glance what these scientific arboriculturists are attempting. Let us take for instance the ten most characteristic features of the *Echini*. The number of possible combinations which can be produced from them is so great that it would take no less than twenty years, at the rate of one new combination a minute for ten hours a day to pass them in review. * * On the other hand, in spite of the millions of possible combinations which these ten characters may assume when affecting not simply a single combination, but all the combinations which might arise from their extending over several hundred species, we yet find that the combinations which actually exist—those which leave their traces as fossils—fall immensely short of the possible number. We have not more than twenty-three hundred species actually representing for the *Echini* the results of these endless combinations. Is it astonishing therefore that we should fail to discover the sequence of the genera, even if the genera, as is so often the case, represent, as it were, fixed embryonic stages of some sea-urchin of the present day?"

Precisely what relation the above considerations bear to the tracing of the phylogenies, it is difficult to perceive. If Mr. Agassiz had insisted that any or all of the millions of possible combinations he has pictured may have existed as extinct species, he would indeed have presented us with an inextricable genealogical puzzle. But he does not do this, for he admits that the number of the forms which have actually existed is limited. Does Mr. Agassiz mean that there has been no order in this limitation; that there have existed no causes which have rendered some combinations possible and others impossible? Such would appear to be the spirit of his proposition, but it is the objection of a mathematician, and not that of a practical biologist. The chairman of Section B admits that genealogies of single characters may be constructed; therefore genealogies of orders, families and genera can be constructed, for they are, or ought to be (for they ultimately must be), defined by single characters. Having thus established the lines of primary definition, the possible range of variation of the contents of the divisions so defined, is greatly restricted. We can no more anticipate the combination of the characters of two main lines of *Echini* after they have been differentiated, than we can expect to find fossil centaurs or sphinxes. So also with the minor lines, though of course the sagacity of the investigator is taxed to ascertain what these are. Thus much in defence of hypothetical lines bridging present gaps in our knowledge. Such have not unfrequently been realized by palæontological discoveries. As to lines already worked out, such as the genera of *Camelidæ*, *Felidæ*, *Rhinocerontidæ*, horses, etc., no question of mathematical probabilities can invalidate the significance of the wonderful closeness of the successive stages which they present.—*E. D. C.*

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[1] See Origin of Genera, 1869, pp. 34-35.

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RECENT LITERATURE.

NELL'S NEW MAP OF COLORADO.[1]—It is strange that in this country there are no map-makers worthy the name. The only decent maps, either of the whole or portions of the country, are those published by the General Government.

It is sad, but true, that the best map of the United States which can be purchased, and I may add which can be obtained, is published not here but in Germany. This is not from want of skill in drafting and engraving, but it seems to be a want of knowledge, of enterprise and of care in those superintending the work. I am roused to this philippic by the appearance of a map of Colorado, which is a vast improvement, both in style and in correctness of compilation, over anything heretofore published for sale in this country.

The map has been compiled by Mr. Louis Nell, a topographical engineer who has been for a number of years connected with the Survey of the Territories under Capt. G. M. Wheeler. He has brought to the work not only a general knowledge of how a country should be represented on a map, but a personal acquaintanceship with a large part of the country represented. The map shows, too, a degree of painstaking accuracy and care which is very rare among us.

The map is evidently compiled, although authorities are not mentioned in detail, from the work of the surveys under Hayden, Wheeler, King and the General Land Office. The scale of the map is 10.5 miles to one inch. The topography is represented by hachures and by contour-curves at every 1000 feet up to 11,000 feet. The county lines are given, and it may be said, in passing, that the map might have been a little clearer if these lines were less pronounced.

All the later changes due to settlement, roads, railroads, etc., have been added, bringing it fully up to date. The estimated area of irrigable (arable) land is represented by colors. The ele-

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[1] *Nell's New Topographical and Township Map of the State of Colorado.* Compiled from U. S. Government Surveys and other authorities. Washington, D. C., 1880. Scale 10.5 miles to one inch.